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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,526	04/15/2004	Kenji Ikeda	Q80776	6591

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EXAMINER	
MARTIN, LAURA E	
ART UNIT	**PAPER NUMBER**
2853	

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01/06/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/824,526	IKEDA ET AL.	
	Examiner	Art Unit	
	LAURA E. MARTIN	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☒ Claim(s) *17 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6-10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichinose (US 2001/0028382 A1) in view of Takahashi (JP 2003-073598 A) and Nojima (US 2002/0045035 A1).

Ichinose discloses the following claim limitations:

As per claim 1: a recording medium comprising a support (figure 1, element 101) and a colorant receiving layer (figure 1, element 102) provided on the support, wherein the colorant receiving layer has a porous structure containing at least organic polymer fine particles [0032], and measuring particle size of the polymer fine particles by a pore distribution curve by a nitrogen gas adsorption method [0034].

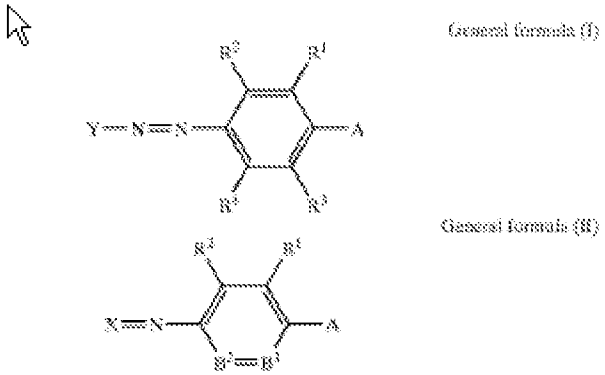
As per claim 16: the organic polymer fine particles are a (co)polymer of a vinyl monomer, an ester-based polymer, a urethane-based polymer, an amide-based polymer, an epoxy-based polymer or an amide-based polymer, or modified materials or copolymers thereof [0122].

Ichinose does not disclose the following clam limitations:

As per claim 1: utilizing an ink composition comprising a colored fine particle dispersion containing at least one kind of hydrophobic dye, at least one kind of

hydrophobic polymer and at least one kind of organic solvent having a high boiling point, wherein a void volume per unit thickness (A/B) of the colorant receiving layer calculated by dividing a void volume A (x 10^{-5} ml/cm^2) of the colorant receiving layer at a void diameter equal to a particle size of the polymer fine particles, by a dry layer thickness B (gm) of the colorant receiving layer is 3.0 to 5.0 (x 10^{-5} ml/cm^2/gm).

As per claim 2: the hydrophobic dye contains at least one kind of compound selected from the group consisting of compounds represented by the following general formula (I), compounds represented by the following general formula (II), compounds represented by the following general formula (Y-I), compounds represented by the following general formula (M-I) and compounds represented by the following general formula (C-I)

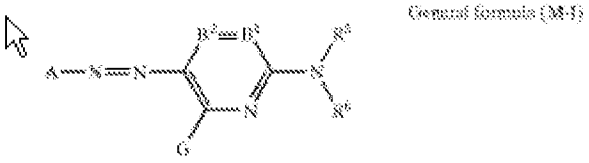


wherein, in General formula (I) and General formula (II), R^1, R^2, R^3, and R^4 each independently represent a hydrogen atom, halogen atom, aliphatic group, aromatic group, heterocyclic group, cyano group, hydroxy group, nitro group, amino group, alkylamino group, alkoxy group, aryloxy group, amide group, arylamino group, ureide group, sulfamoylamino group, alkylthio group, arylthio group, alkoxycarbonylamino

group, sulfoneamide group, carbamoyl group, sulfamoyl group, sulfonyl group, alkoxycarbonyl group, heterocyclic oxy group, azo group, acyloxy group, carbamoyloxy group, silyloxy group, aryloxycarbonyl group, aryloxycarbonylamino group, imide group, heterocyclic thio group, sulfinyl group, phosphoryl group, acyl group, carboxyl group, or sulfo group; A represents --NR^5R^6 or a hydroxyl group; R^5 and R^6 each independently represent a hydrogen atom, aliphatic group, aromatic group or heterocyclic group; R^5 and R^6 may mutually bond to form a ring; B^1 represents =$C(R^3)$- or =N-; B^2 represents -$C(R^4)$= or -N=; and R^1 and R^5, R^3 and R^6 may mutually bond to form an aromatic ring or heterocyclic ring, and/or R^1 and R^2 may mutually bond to form an aromatic ring or heterocyclic ring, General formula (Y-I)

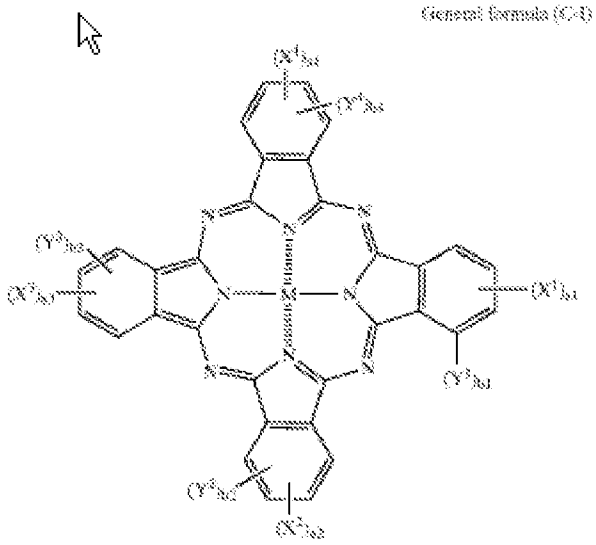
A-N=N-B

wherein, in General formula (Y-I), A and B each independently represent an optionally substituted heterocyclic group,



Wherein, in General formula (M-I), A represents a moiety of a 5-membered heterocyclic diazo component (A-NH_2); B^1 represents = CR^1- and B^2 represents -CR^2=, or alternatively one of B^1 and B^2 represents a nitrogen atom and the other represents =CR^1- or -CR^2=; R^1 and R^6 each independently represent a hydrogen atom, aliphatic group, aromatic group, heterocyclic group, acyl group, alkoxycarbonyl group,

aryloxycarbonyl group, carbamoyl group, alkylsulfonyl group, arylsulfonyl group or sulfamoyl group, each of which may further have a substituent; G, R^1 and R^2 each independently represent a hydrogen atom, halogen atom, aliphatic group, aromatic group, heterocyclic group, cyano group, carboxyl group, carbamoyl group, alkoxycarbonyl group, aryloxycarbonyl group, acyl group, hydroxyl group, alkoxy group, aryloxy group, silyloxy group, acyloxy group, carbamoyloxyl group, heterocyclic oxy group, alkoxycarbonyloxy group, aryloxycarbonyloxy group, amino group substituted with an alkyl group, aryl group or heterocyclic group, acylamino group, ureide group, sulfamoylamino group, alkoxycarbonylamino group, aryloxycarbonylamino group, alkylarylsulfonylamino group, arylsulfonylamino group, aryloxycarbonylamino group, nitro group, alkylthio group, arylthio group, alkylsulfonyl group, arylsulfonyl group, alkylsulfinyl group, arylsulfinyl group, sulfamoyl group, sulfo group, or heterocyclic thio group, each of which may further be substituted; and R1 and R^5, or R^5 and R^6 may bond to form a 5 or 6-membered ring,



Wherein, in General formula (C-I) X^1, X^2, X^3 and X^4 each independently represent $-SO-Z^1$, $-SO^2-Z^1$ or $-SO^2NR^{21}R^{22}$; Z^1 represents a substituted or unsubstituted alkyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryl group, or substituted or unsubstituted heterocyclic group; R^{21} and R^{22} each independently represent a hydrogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryl group, or substituted or unsubstituted heterocyclic group; Y^1, Y^2, Y^3 and Y^4 each independently represent a hydrogen atom, halogen atom, alkyl group, cycloalkyl group, alkenyl group, aralkyl group, aryl group, heterocyclic group, cyano group, hydroxyl group, nitro group, amino group, alkylamino group, alkoxy group, aryloxy group, amide group, arylamino group, ureide group, sulfamoylamino group, alkylthio group, arylthio group, alkoxycarbonylamino group, sulfoneamide group, carbamoyl group, sulfamoyl group,

sulfonyl group, alkoxycarbonyl group, heterocyclic oxy group, azo group, acyloxy group, carbamoyloxyl group, silyloxy group, aryloxycarbonyl group, aryloxycarbonylamino group, imide group, heterocylic thio group, phosphoryl group, acyl group, carbonyl group, or sulfo group, each of which may further have a substituent; a^1 to a^4 and b^1 to b^4 represent the numbers of substituents X^1 to X^4 and Y^1 to Y^4, respectively; a^1 to a^4 each independently represent an integer of 0 to 4; b^1 to b^4 each independently represent an integer of 0 to 4; the sum of a^1 to a^4 is 2 or more; when any one of a^1 to a^4 and b^1 to b^4 represent an integer of 2 or more, a corresponding plurality of any one X^1 to X^4 and Y^1 to Y^4 may be the same or different; a.sup.1 and b.sup.1 each independently represent an integer of 0 to 4 satisfying the relation of $a^1+b^1=4$; a^2 and b^2 each independently represent an integer of 0 to 4 satisfying the relation of $a^2 + b^2 =4$; a^3 and b^3 each independently represent an integer of 0 to 4 satisfying the relation of $a^3 + b^3 =4$; a^4 and b^4 each independently represent an integer of 0 to 4 satisfying the relation of a $a^4 + b^4$ =4; and M represents a hydrogen atom, metal element or its oxide, hydroxide, or halide.

As per claim 3: the organic solvent having a high boiling point is an organic solvent having a water solubility of 4 g or less.

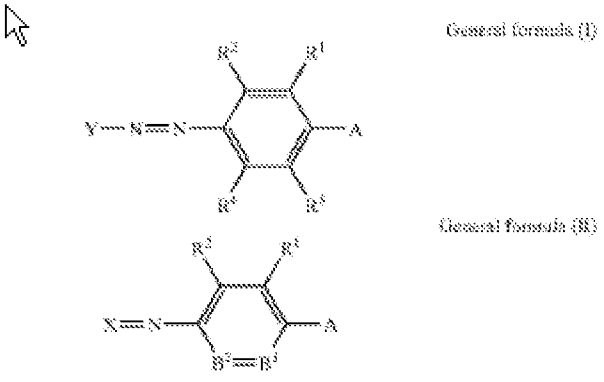
As per claim 4: the void volume A of the colorant receiving layer at the same void diameter as the particle size of the polymer fine particles is 50(x 10^{-5} ml/cm^2).

As per claims 6-10: the porous structure of the colorant receiving layer is formed of secondary particles of the polymer fine particles.

Takahashi et al. disclose the following claim limitations:

As per claim 1: a colored fine particle dispersion containing at least one kind of hydrophobic dye, at least one kind of hydrophobic polymer and at least one kind of organic solvent having a high boiling point [0009],

As per claim 2: the hydrophobic dye contains at least one kind of compound selected from the group consisting of compounds represented by the following general formula (I), compounds represented by the following general formula (II), compounds represented by the following general formula (Y-I), compounds represented by the following general formula (M-I) and compounds represented by the following general formula (C-I) [0010]

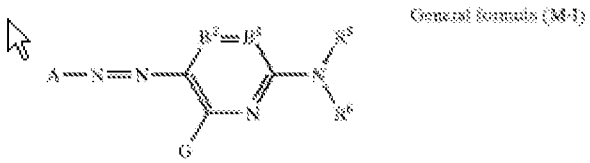


wherein, in General formula (I) and General formula (II), R^1, R^2, R^3, and R^4 each independently represent a hydrogen atom, halogen atom, aliphatic group, aromatic group, heterocyclic group, cyano group, hydroxy group, nitro group, amino group, alkylamino group, alkoxy group, aryloxy group, amide group, arylamino group, ureide group, sulfamoylamino group, alkylthio group, arylthio group, alkoxycarbonylamino group, sulfoneamide group, carbamoyl group, sulfamoyl group, sulfonyl group, alkoxycarbonyl group, heterocyclic oxy group, azo group, acyloxy group, carbamoyloxy

group, silyloxy group, aryloxycarbonyl group, aryloxycarbonylamino group, imide group, heterocyclic thio group, sulfinyl group, phosphoryl group, acyl group, carboxyl group, or sulfo group; A represents --NR^5R^6 or a hydroxyl group; R^5 and R^6 each independently represent a hydrogen atom, aliphatic group, aromatic group or heterocyclic group; R^5 and R^6 may mutually bond to form a ring; B^1 represents =$C(R^3)$- or =N-; B^2 represents -$C(R^4)$= or -N=; and R^1 and R^5, R^3 and R^6 may mutually bond to form an aromatic ring or heterocyclic ring, and/or R^1 and R^2 may mutually bond to form an aromatic ring or heterocyclic ring, General formula (Y-I)

A-N=N-B

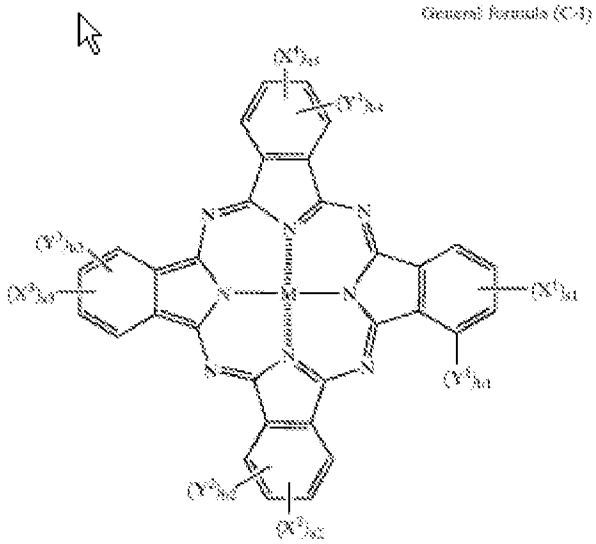
wherein, in General formula (Y-I), A and B each independently represent an optionally substituted heterocyclic group,



General formula (M-I)

Wherein, in General formula (M-I), A represents a moiety of a 5-membered heterocyclic diazo component (A-NH_2); B^1 represents = CR^1- and B^2 represents -CR^2=, or alternatively one of B^1 and B^2 represents a nitrogen atom and the other represents =CR^1- or -CR^2=; R^1 and R^6 each independently represent a hydrogen atom, aliphatic group, aromatic group, heterocyclic group, acyl group, alkoxycarbonyl group, aryloxycarbonyl group, carbamoyl group, alkylsulfonyl group, arylsulfonyl group or sulfamoyl group, each of which may further have a substituent; G, R^1 and R^2 each

independently represent a hydrogen atom, halogen atom, aliphatic group, aromatic group, heterocyclic group, cyano group, carboxyl group, carbamoyl group, alkoxycarbonyl group, aryloxycarbonyl group, acyl group, hydroxyl group, alkoxy group, aryloxy group, silyloxy group, acyloxy group, carbamoyloxyl group, heterocyclic oxy group, alkoxycarbonyloxy group, aryloxycarbonyloxy group, amino group substituted with an alkyl group, aryl group or heterocyclic group, acylamino group, ureide group, sulfamoylamino group, alkoxycarbonylamino group, aryloxycarbonylamino group, alkylarylsulfonylamino group, arylsulfonylamino group, aryloxycarbonylamino group, nitro group, alkylthio group, arylthio group, alkylsulfonyl group, arylsulfonyl group, alkylsulfinyl group, arylsulfinyl group, sulfamoyl group, sulfo group, or heterocyclic thio group, each of which may further be substituted; and R1 and R^5, or R^5 and R^6 may bond to form a 5 or 6-membered ring,



Wherein, in General formula (C-I) X^1, X^2, X^3 and X^4 each independently represent $-SO-Z^1$, $-SO^2-Z^1$ or $-SO^2NR^{21}R^{22}$; Z^1 represents a substituted or unsubstituted alkyl

group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryl group, or substituted or unsubstituted heterocyclic group; R^{21} and R^{22} each independently represent a hydrogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted cycloalkyl group, substituted or unsubstituted alkenyl group, substituted or unsubstituted aralkyl group, substituted or unsubstituted aryl group, or substituted or unsubstituted heterocyclic group; Y^1, Y^2, Y^3 and Y^4 each independently represent a hydrogen atom, halogen atom, alkyl group, cycloalkyl group, alkenyl group, aralkyl group, aryl group, heterocyclic group, cyano group, hydroxyl group, nitro group, amino group, alkylamino group, alkoxy group, aryloxy group, amide group, arylamino group, ureide group, sulfamoylamino group, alkylthio group, arylthio group, alkoxycarbonylamino group, sulfoneamide group, carbamoyl group, sulfamoyl group, sulfonyl group, alkoxycarbonyl group, heterocyclic oxy group, azo group, acyloxy group, carbamoyloxyl group, silyloxy group, aryloxycarbonyl group, aryloxycarbonylamino group, imide group, heterocylic thio group, phosphoryl group, acyl group, carbonyl group, or sulfo group, each of which may further have a substituent; a^1 to a^4 and b^1 to b^4 represent the numbers of substituents X^1 to X^4 and Y^1 to Y^4, respectively; a^1 to a^4 each independently represent an integer of 0 to 4; b^1 to b^4 each independently represent an integer of 0 to 4; the sum of a^1 to a^4 is 2 or more; when any one of a^1 to a^4 and b^1 to b^4 represent an integer of 2 or more, a corresponding plurality of any one X^1 to X^4 and Y^1 to Y^4 may be the same or different; a.sup.1 and b.sup.1 each independently represent an integer of 0 to 4 satisfying the relation of $a^1+b^1=4$; a^2 and b^2 each independently

represent an integer of 0 to 4 satisfying the relation of $a^2 + b^2 = 4$; a^3 and b^3 each independently represent an integer of 0 to 4 satisfying the relation of $a^3 + b^3 = 4$; a^4 and b^4 each independently represent an integer of 0 to 4 satisfying the relation of a $a^4 + b^4 = 4$; and M represents a hydrogen atom, metal element or its oxide, hydroxide, or halide [0011-0017].

As per claim 3: the organic solvent having a high boiling point is an organic solvent having a water solubility of 4 g or less [0009].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Ichinose with the disclosure of Takahasi et al. in order to create a high quality image using ink and medium.

Nojima et al. disclose the following claim limitations:

As per claim 1: a porous structure containing at least organic polymer fine particles (column 22, lines 1-10) and the void volume per unit thickness is 3.0 to 5.0 (x 10^{-5} ml/cm^2/micrometers) or more (column 12, lines 1-7 - dry thickness is 10 micrometers and void volume is 5 ml/m^2 - void volume per unit thickness is 5.0 (x 10^{-5} ml/cm^2/micrometers)).

As per claim 4: the void volume A of the colorant receiving layer at the same void diameter as the particle size of the polymer fine particles is 50(x 10^{-5} ml/cm^2) [0119].

As per claims 6-10: the porous structure of the colorant receiving layer is formed of secondary particles of the polymer fine particles [0086].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Ichinose with the disclosure of Nojima et al. in order to provide high ink absorption and a high surface smoothness.

Claims 5 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichiniose (US 2001/0028382 A1), Takahashi (JP 2003-073598 A) and Nojima et al. (US 2002/0045035 A1), and further in view of Yoshino et al. (US 5955185 A).

Ichinose as modified disclose the following claim limitations:

The method of claim 1.

Ichinose as modified do not disclose the following claim limitations:

As per claim 5: an ink jet recording method, wherein a ratio [(Y/X)x100] of a void diameter Y (nm) corresponding to a maximum peak of the void volume of the colorant receiving layer obtained from a pore distribution curve by a nitrogen gas adsorption method, to the particle size X (nm) of the polymer fine particles is 65% or more.

As per claims 11-15: an ink jet recording method according to claim 6, wherein a void diameter Y corresponding to a maximum peak of a void volume formed by the secondary particles of polymer fine particles of the colorant receiving layer obtained from a pore distribution curve by a nitrogen gas adsorption method is 33 nm or more.

Yoshino et al. disclose the following claim limitations:

As per claim 5: an ink jet recording method, wherein a ratio [(Y/X)x100] of a void diameter Y (nm) corresponding to a maximum peak of the void volume of the colorant receiving layer obtained from a pore distribution curve by a nitrogen gas adsorption method, to the particle size X (nm) of the polymer fine particles is 65% or more (column 8, lines 29-35).

As per claims 11-15: an ink jet recording method according to claim 6, wherein a void diameter Y corresponding to a maximum peak of a void volume formed by the secondary particles of polymer fine particles of the colorant receiving layer obtained from a pore distribution curve by a nitrogen gas adsorption method is 33 nm or more (column 7, lines 40-45).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method taught by Ichinose as modified with the disclosure of Yoshino et al. in order to produce higher resolution and the capability of printing in a full-color mode on a higher quality print media.

Allowable Subject Matter

Claims 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 10/20/08 have been fully considered but they are not persuasive.

Applicant argues that Nojima concerns a porous interlayer, which is different from the ink absorptive layer, and thus Nojima neither teaches nor suggests having a porous structure as presently claimed. The colorant receiving layer can contain both an interlayer and a top layer. Applicant's invention does not limit the colorant receiving layer to only having a top layer.

Applicant argues that Nojima's ink absorptive layer contains inorganic particles; however, the examiner uses Nojima to modify Ichinose so as to teach the void volume. The primary reference teaches the organic fine particles being in the ink absorptive layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAURA E. MARTIN whose telephone number is (571)272-2160. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. E. M./
Examiner, Art Unit 2853

Laura E. Martin

/Manish S. Shah/

Primary Examiner, Art Unit 2853